

30 more stations than there are at present and that work is now in the hands of a society known as the Aero-Arctic Society with headquarters at Berlin and subscribed to by every Government in the Northern Hemisphere without exception. * * * The plan for investigation at the polar regions is not going to open the way in itself to accurate meteorological forecasting, but it is going to help if we can collect our information and correlate it with that which has already been gathered from other parts of the world.—(Excerpted from the *New York Times* of March 21, 1929.)

Flying weather over Greenland.—Prof. William H. Hobbs, director of the University of Michigan Greenland expeditions, is a strong advocate of the Greenland air route between America and Europe, which offers the great advantage of avoiding the long "hops" of more southerly routes and also of passing to the northward of the fog-ridden Newfoundland Banks. The route he recommends starts at Chicago, crosses British America to Cape Chidley, spans the relatively narrow Baffin Bay to the west coast of Greenland, crosses the inland ice of Greenland to Angmagssalik, on the east coast, continues thence to Reykjavik, Iceland, and then crosses to any desired point in northwestern Europe. Concerning certain climatic features of this route he says:

Over Greenland, and particularly over the great dome of inland ice, fogs are exceedingly rare, if we except the shallow near-surface stratum of the remote Greenland interior. This zone of mist and fine snow may constitute a serious handicap, in that ice may form on the fuselage. It is believed, however, that this dangerous zone can be avoided by flying at a height of a few hundred feet above the flat surface of the dome, which is at a level of about 9,000 feet.

The glacial anticyclone located permanently over the inland ice consists of upper currents moving in toward the center, there settling to the ice surface, and passing out centrifugally toward all margins. It is therefore only necessary for the pilot to ascend a few thousand meters so as to enter the upper currents and proceed to the center with a tail wind, and, after crossing the central region, to descend into the surface current and go out with a tail wind. This circulation can be used as well on the westward as on the eastward journey.

The surface of the inland ice, except near its margin, is nearly as level as a ballroom floor and is also hard enough for landing with wheels or skis within broad zones on either side.—C. F. Talman, in *Why the Weather?* Science Service, March 19, 1929.

French meteorological activity, 1928.—In the Finance Committees' report to the 1929 Air Budget, General Hirschner outlines the work of the meteorological service for 1928, as follows:

The requests for regular meteorological reports pertaining to air navigation have steadily increased during 1928. The information desired pertained particularly to long-distance flights, thus complicating the gathering and dissemination of information. During the period from May to August, for example, the number of reports to various meteorological stations averaged from 50 to 60 per day and required messages aggregating some 2,500 words.

Meteorological information was divided into three general classes—that for civilian air lines, flights undertaken by either the military or naval air services, and long-distance flights.

CIVILIAN AIR LINES

Nine civilian air lines were organized during 1928 * * *. To cover completely this increasing number of air lines it was necessary to create auxiliary posts (gendarmerie, airdrome caretakers, etc.) for simple observations which, nevertheless, required careful checking. On certain lines, the service starts very early in the morning, necessitating observations during the night and at daybreak. It was necessary to arrange with the various departments, particularly the auxiliary services, and to obtain permission to use personnel for gathering and transmitting the information. The situation is particularly complicated since our regular lines are practically all international in character. This requires close liaison between meteorological services of the interested countries.

MILITARY FLIGHTS

These may be classified as follows: Individual flights, formation cross-country flights, and night flights. The protection of individual flights is assured by the normal system of information.

Usually the pilots on such individual flights are experienced men who are capable of coping with difficult meteorological situations.

Formation cross-country flights necessitate a much closer control and the information furnished must be more complete. Additional means of transmission are thus necessary and in preparation for such flights rather complicated orders may be required. The importance of meteorological information can not be too greatly stressed. In spite of the great progress which has been made, two serious accidents occurred during 1928 which might have been evaded. A pilot left an eastern airdrome during local clear weather but became lost in a fog which covered a great part of France. He was forced down and in landing his plane turned over. A squadron flying in formation left an eastern airdrome under good local weather conditions but met with a series of violent storms which had been forecast and reported by the Meteorological Bureau. The squadron was dispersed and partly destroyed.

NIGHT FLIGHTS

Until 1927 night flying was restricted to the areas over Chartres and Nancy where the night bombarding regiments are stationed. During 1928, however, individual and formation night flights took place over the whole of France. This necessitated in many cases a special meteorological organization, since the last information received, in the normal network, is at 6 p. m. It was impossible to exact too much night work of personnel required to make early morning observations.

Since training in night flying will continue, it will be necessary to provide adequate funds to make the night meteorological service effective.

LONG-DISTANCE FLIGHTS

These flights generally pass beyond the limits of France and sometimes those of Europe. They usually begin early in the morning and are often postponed from day to day. This imposed a great responsibility upon the meteorological service. * * *

SCIENTIFIC STUDIES

The method of forecasting weather conditions has undergone very marked improvement, thanks to the work of our meteorologists and those abroad. Meteorological studies in connection with trans-Atlantic flights have had an important effect on the study of the atmosphere over the ocean. * * *

HIGH ATMOSPHERE

The Trappes Observatory continued its work on the temperature, pressure, and hygrometry of the high atmosphere. Balloon observations were made, either in conjunction with international soundings, or at favorable times and in connection with special studies. As a general rule, twin balloons were used since they are easier to locate after landing, and in addition will carry more complete equipment consisting of the baro-thermo-hygro, and other apparatus.

INTERNATIONAL RELATIONS

International collaboration is essential in meteorology. Numerous conferences and international congresses have taken place during 1928. These may be divided into three groups: Conferences on purely meteorological subjects; Air conferences with meteorological commissions; radio conferences.

Meteorological conferences.—Certain of these are scientific and pertain to the unification of methods which are essential to the development of the science. (Commission for the exploration of the high atmosphere which met in 1927 at Leipzig; Session of the International Geodetical and Geophysical Union which met in Prague in 1927.) Others concern the organization necessary for the transmission of radiograms. (Commission for the radio-meteorological organization over the sea which met in London in 1928).

The first of these conferences, presided over by the Director of the National Meteorological Bureau, began a complete organization for radiometeorological observations at sea and particularly over the Northern Atlantic. The second treated of the problems incident to the functioning of the world's radiometeorological network and prepared a new code for the transmission of meteorological observations. These two conferences were the first to be attended by representatives of the American meteorological service since the war.

Aeronautical conferences.—The proper functioning of international air lines necessitates periodical conferences which deal with

the many questions pertaining to the exploitation of these lines. The organization of the meteorological service requires modification in accordance with new extensions of the international air lines and to cope with new problems. The latest aeronautical conferences have prepared a general program of radiometeorological liaison which will permit of unlimited development of air activity.

Radio conferences.—Meteorology, particularly aviation meteorology, is very dependent upon radiotelegraphy. However, the radio facilities are not sufficient to handle all of the traffic. This necessitates international agreements for the redistribution of wave lengths. The radiotelegraphic conference held at Washington has entirely modified the international radio chart, which dated from 1912. For the first time, international meteorology was represented, and one of these representatives was a Frenchman. Meteorology has obtained in the new international radiotelegraph regulations a place corresponding to its essential needs. * * *

DEVELOPMENT OF THE WORLD'S NETWORK

The development in length of long-distance flights and of the great international lines entails a development in area of information received, and since meteorological observations throughout the world must take place at the same time and since the transmission of the information must be as rapid as possible it becomes necessary to concentrate during certain hours information gathered from one-third the surface of the globe. For lack of appropriate means, the bureau had to resort to technical means not yet in general use.

Several meteorological radiograms are received daily from America. These are made possible by the powerful sending sets in use in America and the excellent reception in France. Unfortunately, due to the poor sending facilities placed at our disposal and the difficult condition of reception in America, we have been unable to effect a proper exchange. America is sending us daily more than 600 words and has received nothing from us. This is an abnormal condition which can not last indefinitely.

Adequate radio communication with America is essential. So far no expenditure has been made for this purpose and only existing means have been available. If improvements which are to be made in the military stations on the Eiffel Tower and at Issy-les Moulineaux are not sufficient to solve this problem, money must be appropriated to create the necessary technical means.

Actually, the use of long and of short waves permit the reception in Europe of American information. The situation is not quite so favorable with respect to information at sea. The collaboration of France in "ship's observation" would be very meager were it not for the *Jacques Cartier*. Notwithstanding means utilized since 1921, and the free assistance given by the French Line and the Radio-Maritime Co., it has been impossible to obtain

satisfactory transmission by coast stations of meteorograms sent from French ships over the North Atlantic. The bureau first used the naval stations but they could not assure liaison with commercial ships, for various reasons. The bureau then tried to transmit its radiograms by the postal stations along the coasts, paying the entailed expenses, but without satisfactory results. This situation must be remedied if France is to play its part in the vast program established by the International Commission for the Meteorological Organization at Sea. * * *

(Prepared under the direction of Brig. Gen. William W. Harts, military attaché at Paris.)

Meteorological summary for Chile, January, 1929 (by J. Bustos Navarrete, Observatorio del Salto, Santiago, Chile).—January, 1929, was characterized by unusually high temperatures in the central and southern zones especially between the 15th and 20th; maximum temperatures exceeded 86° between Santiago and Valdivia and at the close of the period 95° was recorded at San Fernando and 100° at Talca.

During the first half of the month atmospheric activity was practically at a standstill even in the south; no rain fell at Valdivia.

On the 18th a reaction set in with a depression crossing the extreme south and bringing scattered rains as far as Corral; then from the 24th to the 26th another depression influenced the weather in the southern zone with unsettled weather occurring between Valdivia and Chiloe.

On the 29th there suddenly appeared from the west, in about latitude 45° south, a marked cyclonic area (barometric minimum 29.13 inches) similar to those of midwinter; this depression affected a considerable area. The storm began in the south late on the 29th and extended to the remainder of the country on the 30th, bringing high north winds and abundant rainfall from Magallanes to Aconcagua. The unsettled weather abated on the 31st. The amounts of precipitation ranged from 0.80 to 1.20 inches in the central zone to 1.60 to 3.90 inches in the southern zone.

Anticyclonic centers were practically absent; the only ones meriting mention were charted on the 4th over Chiloe and on the 23d over the Juan Fernandez Islands.—*Translated by W. W. R.*

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